DOCUMENT RESUME

ED 260 108 TM 850 430

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TITLE Validation of the NTE and Recommended Performance Standards for Certification in Tennessee.
PUB DATE Mar 85
NOTE 23p.; Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cutting Scores; Elementary School Teachers; Elementary Secondary Education; Evaluation Criteria; Higher Education; *Minimum Competency Testing; Secondary School Teachers; *State Standards; *Teacher Certification; Teacher Education Curriculum; Teacher Evaluation; Teaching Skills; Test Validity
IDENTIFIERS Curricular Validity; *National Teacher Examinations; *Tennessee

ABSTRACT

The National Teacher Examinations (NTE) Core Battery and Specialty Area tests were assessed to determine (1) test validity and (2) minimum performance standards for use in the state of Tennessee. The NTE was reviewed by 316 teacher education personnel, who focused on its relevance to teacher education programs. A group of 288 local school district staff judged the NTE on the basis of its relevance to entry-level teaching competence. Both groups also estimated the correct response rate, for each item, among minimally qualified certification applicants. The data were reviewed by a Standards Committee consisting of thirteen educational and lay representatives named by the Commissioner of Education. The Committee determined that all three of the NTE's Core Battery tests were valid for use in Tennessee, and that 23 of the 25 specialty area tests were valid. The two tests which were declared invalid--art education and education of the mentally handicapped--did not adequately represent their specialized curricula. The Committee also recommended acceptable minimum qualifying scores, based on the panel's estimates of minimum competencies, and the test results of recent examinees in the area. The qualifying scores were to be raised each year from 1984 to 1989. (GDC)

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VALIDATION OF THE NTE AND RECOMMENDED PERFORMANCE STANDARDS FOR CERTIFICATION IN TENNESSEE

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TM 850 430

Paper presented at the 1985 Annual Meeting of the American Educational Research Association; Chicago, Illinois; March 31 - April 4, 1985

Introduction

The Comprehensive Education Reform Act of 1984 (Senate bill No. 1), enacted by the Tennessee General Assembly and signed by Governor Lamar Alexander on March 6, 1984, introduced a new requirement for initial certification of public school personnel effective on July 1, 1984. Certification applicants must present minimum qualifying scores on secured tests of communication skills, general knowledge, professional knowledge, and endorsement area specializations. The tests to be used for this purpose must be validated and have qualifying scores established before being adopted to meet certification requirements.

The National Teacher Examinations (NTE) tests were identified as potentially useful in assessing the competence of applicants for initial certification in Tennessee. The NTE consists of three Core Battery tests and 25 Specialty Area tests. The Core Battery Communication Skills Test contains four sections: Listening, Reading, Writing-Essay, and Writing-Multiple Choice. The General Knowledge Test of the Core Battery covers four areas from the college general education curriculum: Literature and Fine Arts, Mathematics, Science, and Social Studies. The Core Battery Professional Knowledge Test has only one section covering specialized knowledge related to education. Each of the Specialty Area tests focuses on knowledge of the content and methods that apply to the specific subject field.

Tennessee NTE Study Objectives

The Tennessee State Department of Education contracted with Memphis State University to conduct a study of the NTE tests during the Spring of 1984. The study was designed to accomplish two objectives: (1) to determine the valdity of the NTE tests as measures of the knowledge and academic skills required for initial certification in Tennessee and (2) to develop recommendations on

minimum qualifying scores for the NTE tests that are valid to use in Tennessee. The scope of the study was delimited to use of the NTE tests in the identification of applicants who meet minimum qualifications for initial certification rather than to select personnel for employment.

Strategy

The strategy utilized in the study involved groups or panels of teacher education institutional personnel in the review of test content, local school district professional staff in the assessment of job relevance of test items, and both groups in the estimation of correct response rates by test item among minimally qualified certification applicants. A single panel of higher education and local school district personnel performed all functions for the Writing-Essay section of the Communication Skills Test. A separate committee reviewed the data compiled from the responses of these panels in order to make decisions on test validity and recommendations on minimum qualifying scores for valid tests. This strategy has been used in recent NTE validation studies by Educational Testing Service (Faggen, 1983; Masonis, 1983).

Rationale for the Methodology

The literature on validation and standard-setting for certification examinations does not demonstrate a singular appropriate or clearly superior methodology. The use of professional judgment under relatively controlled conditions as employed in this study complies with accepted measurement principals that have been widely used. The legal rationale for this study is based on the requirement that validity must be demonstrated using job relatedness as the referent (Roth, 1984).

The validation aspect of the study complies with the professional guidelines promulgated in Standards for Educational and Psychological Tests

(American Psychological Association, 1974). The standards for content validation require the following:

> Evidence of content validity is required when the test user wishes to estimate how an individual performs in the universe of situations the test is intended to represent. . . . To demonstrate the content validity of a set of test scores, one must show that the behaviors demonstrated in testing constitute a representative sample of behaviors to be exhibited in a desired performance domain. (p. 28)

Consequently, the content review by higher education faculty members focused on the congruence between the content domains of the NTE tests and the related domains of the professional preparation programs in Tennessee.

The "General Standards for Validity Studies" in the Uniform Guidelines on Employee Selection Procedures (Equal Employment Opportunity Commission, 1978) state that:

> Evidence of the validity of a test or other selection procedure through a construct validity study should consist of data showing that the procedure measures the degree to which candidates have identifiable characteristics which have been determined to be important in successful performance in the job for which the candidates are to be evaluated. (p. 38298)

Therefore, job relevance of the NTE tests was included as an additional dimension of the tests' validity assessment. Personnel from local school districts reviewed the NTE Core Battery and Specialty Area tests to provide information on the relevance of the tests to the responsibilities of beginning professional public educators in Tennessee.

In establishing minimum score requirements, the Standards for Educational and Psychological Tests state that "If specific cutting scores are to be used

as a basis for decisions, a test user should have a rationale, justification, or explanation of the cutting scores adopted" (APA, p. 66). The rationale for the recommendations on minimum qualifying scores derived in this study is that the scores must be based on the collective judgments of representative experts. The personnel who performed the knowledge estimation function were qualified experts from local school districts and professional preparatory higher education institutions throughout Tennessee. Their combined judgments constituted the basis for determining the minimum scores on knowledge and academic skills required for initial certification and endorsement of professional public education personnel in Tennessee.

Panel Selection

The nomination of potential panel members was made in response to a written request from the Commissioner of Education that specified by area of specialization the number of nominees to be named. Nominations were submitted by the chief academic administrators of the 36 teacher education program units in Tennessee. The superintendents of 46 representative local school districts throughout the state submitted nominations. Panel members who actually participated in the study were from 34 teacher education institutions and 42 local school districts.

The selection of panel members was performed by the study staff based on several factors. Within each area of specialization, nominees were selected on the basis of requisite expert qualifications, representation of males and females, representation of relevant ethnic groups, and representation of institutions offering specialist training programs in Tennessee. A total of 316 higher education personnel and 288 local school district representatives participated in the study.

Panel Functions

A current edition of each NTE test was supplied by Educational Testing Service (ETS) for review by the panel members selected for each test. All panel members worked independently in conducting the reviews following instructions given by ETS personnel, who supervised the data collection. One-day meetings to collect the data were held in Knoxville, Nashville, and Memphis on April 30, May 1, and May 3, 1984, respectively.

Each of the content review panel members from higher education institutions performed three tasks. First, the panelist examined each test question on the assigned test to judge whether or not at least 90 percent of the students completing the appropriate preparation program would have the opportunity to acquire the knowledge or academic skills to answer the question correctly. Second, the panelist made judgments about the congruence between the proportion of the test devoted to each topic and the emphasis on the topic in the curriculum required for professional preparation. Third, the panelist indicated the degree to which the test as a whole was congruent with the total professional preparation program.

Each of the job relevance panel members from local school districts reviewed each test question on the assigned test to make judgments about the relevance of the knowledge or academic skills to competent performance as a beginning educational practitioner in Tennessee. The relevance of each item was judged as Crucial, Important, Questionable, or Not Relevant.

The knowledge estimation panel members were the individuals who performed the content review and job relevance assessments. At the test question level, each panelist made judgments about the difficulty of each test question for persons who have the minimum levels of knowledge and academic skills necessary for competent performance as a beginning educational practitioner in

Tennessee.

The essay panel was composed of approximately equal numbers of higher education and local school district personnel. They performed the content review, job relevance, and knowledge estimation functions for the Writing-Essay section of the Communication Skills Test. While the panelists met as a group, they made independent judgments on each of the three factors.

Standards Committee

A group of 13 educational and lay representatives was named by the Commissioner of Education to serve as the Standards Committee for the study. The committee met in Nashville on June 5-6, 1984, to perform two tasks. First, the committee reviewed the data on appropriateness (content review and job relevance) for each NTE test and made a decision on its validity for use in Tennessee. Second, the committee developed recommendations on minimum qualifying scores for the valid NTE tests based on a review of the knowledge estimation data and distributions of scores for NTE examinees.

Presentation of Data

Two types of information are summarized in this section of the report. They are demographic data on panel participants and the Standards Committee and results of the panel functions (content review, job relevance, essay review, and knowledge estimation).

Demographic Data

The higher education and local school district personnel who served on the panels were described by geographic area, gender, and ethnic background. The two groups were distributed on these variables as follows:

	Higher education personnel (N=316)	Local school district personnel (N=288)
Geographic Area		
East	29%	37%
Middle	36%	33%
West	34%	30%
Gender		
Male	61%	26%
Female	38%	73%
No response	1%	under 1%
Ethnic Group		
Black	8%	13%
White	89%	84%
Other/no response	4%	3%

The 13-member Standards Committee was a representative group of educational and lay personnel. The committee was described on the variables of gender and ethnic background as follows:

Gender	
Male	46%
Female	54%
Ethnic Group	
Black	38%
White	62%

Content Review

The content review of the NTE tests was performed at three levels: test question, test topic, and total test. Appendix A presents the results of the item review for each test. The data indicate that over 50 percent of the panelists who reviewed each test reported at least 80 percent of the items for all tests except Art Education are included in the college curriculum of the general education and specialized preparation programs. Although the percentages of items are generally lower, the same pattern exists when the 60 percent criterion is applied with the panelists.

Appendix B contains a derived index for each test that represents the

degree of difference between the topical emphases of the test and the college curriculum. Based on an index of 0 (close similarity) to 100 (little similarity), the range of the index values was from 10.4 for two of the Core Battery test sections to 51.4 for the test on the Art Education Specialty Area. Most of the index values were between 20 and 40.

The data that are summarized in Appendix C represent the comparison of each total test and the overall college curriculum for the related prepartory program. The percentages of panelists who indicated close parallel or some difference were relatively high for most tests. Only a few of the tests as a whole were judged to be appreciably dissimilar to the related preparatory programs.

Job Relevance

Appendix D presents the results of the job relevance ratings of test questions for each NTE test by local school district personnel. Responses of Crucial or Important were defined as relevant for this analysis. Over 50 percent of the panelists who reviewed each test indicated that more than half of the questions on the test were relevant to competent performance as a beginning educational practitioner in Tennessee.

Essay Review

The results of the panelists' review of two representative essay questions from the Writing-Essay section of the Communication Skills Test are depicted in Appendix E. For the questions from both test forms, 14 of the 15 panelists reported that examinees have the opportunity to acquire the writing skills required to prepare an acceptable essay. All panelists indicated that the writing skills tested are relevant to competent performance as a beginning educational practitioner in Tennessee.

Knowledge Estimation

The responses of panel members in performing the knowledge estimation function for each test were analyzed to derive estimated raw score means for minimally qualified certification candidates. Using conversion factors provided by ETS, the scaled score mean was derived for each NTE Core Battery and Specialty Area test. The results are presented in Table 1.

The scaled scores for each NTE Core Battery test can vary from a low of 600 to a high of 690, a 90-point range. The scaled scores for the NTE Specialty Area tests have a range from 250 to 990, a 740-point difference between the lowest and highest score. For two reasons, scores cannot be compared directly among the three Core Battery tests or among the 25 Specialty Area tests. First, each test is normed independently on different groups of examinees. Second, the standard errors of measurement, an index of precision in the scores for each test, vary to a considerable degree.

Standards Committee Actions

In order to act formally as a committee, the Standards Committee elected a member to serve as chair during its deliberations. The decisions on test validity and recommendations on minimum qualifying scores and other matters are reported below.

Test Validity Decisions

The Standards Committee reviewed all data collected and analyzed for the content review and job relevance functions. (Knowledge estimation data were not made available until the test validity decisions were made.) The committee considered the content review results (test question, test topic, and total test levels) and job relevance results concurrently in making decisions on test validity. Utilizing this approach, the committee concluded that all sections

Table 1
Summary of Analyses on Estimated Scores for Minimally Qualified Certification Candidates by NTE Test

Test Number and Name	No. of Items Scored	Raw Score Mean	Weight	Scaled Score Mean	Standard Error of Measurement	N
Core Battery						
Communication Skills:						
61 Listening	40	31.655	2.3624	-------	-------	33
62 Reading	30	21.103	2.6313	-------	-------	34
63 Writing-Essay*	1	5.333	3.8581	-------	-------	15
64 Writing-Multiple Choice	45	32.004	1.0000	-------	-------	34
Composite**	116	182.889	------	662.109	3.3	--
General Knowledge:						
65 Literature and Fine Arts	35	21.493	1.0000	-------	-------	23
66 Mathematics	25	16.549	1.2243	-------	-------	24
67 Science	30	19.312	1.1666	-------	-------	23
68 Social Studies	30	20.100	1.1688	-------	-------	25
Composite**	120	87.776	------	658.090	3.5	--
69 Professional Knowledge	104	63.779	------	655.194	4.0	38
Specialty Area						
1 Education in Elementary School	147	90.191	------	657.535	24	18
2 Early Childhood	149	94.794	------	692.145	27	20
3 Biology and General Science	160	97.483	------	650.254	18	16
4 English Language and Literature	150	93.554	------	628.931	21	18
5 Industrial Arts Education	148	93.319	------	704.343	19	16
6 Mathematics	120	77.009	------	705.715	23	20
7 Chemistry, Physics, and General Science	150	97.536	------	685.529	21	18
8 Social Studies	149	87.845	------	653.460	22	17
9 Physical Education	150	97.002	------	730.550	25	23
10 Business Education	157	93.599	------	694.625	23	19
11 Music Education	150	88.500	------	656.778	28	20
12 Home Economics	150	96.650	------	627.125	23	16
13 Art Education	150	93.348	------	639.005	26	20
17 French	179	107.962	------	675.433	21	18
18 German	160	94.439	------	622.256	25	15
19 Spanish	157	97.050	------	643.024	22	18
20 Introduction to Reading	150	90.788	------	639.790	26	19
22 Speech Communication	150	99.731	------	709.674	30***	15
30 Reading Specialist	150	99.658	------	651.155	26	19
31 Media Specialist	138	80.461	------	645.295	25	21
32 Education of Mentally Retarded	150	96.322	------	675.639	26	19
33 Speech-Language Pathology	130	78.353	------	674.974	27	20
34 Audiology	130	92.253	------	698.220	22	18
41 Educational Administration	150	86.317	------	700.893	20	19
42 Guidance	155	102.712	------	708.010	26	18

*Score range is 0 to 12.
**Composite raw score mean is weighted raw score mean.
***Estimated by ETS.

of the NTE Core Battery tests and 23 of the 25 NTE Specialty Area tests are valid for use in Tennessee. (See Table 2.) The two tests that were declared invalid - Art Education and Education of the Mentally Retarded - did not adequately represent the curriculum content of the specialized preparation programs for these areas.

Recommended Minimum Qualifying Scores

The Standards Committee received from the project staff the results of the knowledge estimation of minimally qualified beginning educational practitioners that was made by the panel members. In addition to the raw score mean and scaled score mean for each test, a scaled score representing three standard errors of measurement below the scaled score mean was reported. (The use of minimum qualifying scores that are three standard errors of measurement below the estimated mean is justifiable statistically to account for the imprecision of the tests.)

The committee assessed the impact of using minimum qualifying scores three standard errors of measurement below the estimated scaled score means. The assessment was made by reviewing the failure rates on two sets of score distributions: (1) the scores of all examinees from Tennesee who took the NTE Core Battery tests at the March, 1984, administration and (2) the scores of all examinees form the Southeast (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia) classified by ethnic group who took the NTE Specialty Area tests between July, 1980, and November, 1983. This review revealed that the failure rate based on minimum qualifying scores three standard errors of measurement below the estimated scaled score means was unacceptably high in the view of the committee.

After considering various alternatives, the commiteee recommended a four-step progression of increased minimum qualifying scores on the NTE Core Battery

Table 2
Compilation of Committee Decisions on Validity
of NTE Tests for Use in Tennessee

Test Number and Name	Validity Decision
Core Battery	
Communication Skills:	
61 Listening	Valid
62 Reading	Valid
63 Writing-Essay	Valid
64 Writing-Multiple Choice	Valid
General Knowledge:	
65 Literature and Fine Arts	Valid
66 Mathematics	Valid
67 Science	Valid
68 Social Studies	Valid
Professional Knowledge	Valid
Specialty Area	
1 Education in Elementary School	Valid
2 Early Childhood	Valid
3 Biology and General Science	Valid
4 English Language and Literature	Valid
5 Industrial Arts Education	Valid
6 Mathematics	Valid
7 Chemistry, Physics, and General Science	Valid
8 Social Studies	Valid
9 Physical Education	Valid
10 Business Education	Valid
11 Music Education	Valid
12 Home Economics	Valid
13 Art Education	Not Valid
17 French	Valid
18 German	Valid
19 Spanish	Valid
20 Introduction to Reading	Valid
22 Speech Communication	Valid
30 Reading Specialist	Valid
31 Media Specialist	Valid
32 Education of Mentally Retarded	Not Valid
33 Speech-Language Pathology	Valid
34 Audiology	Valid
41 Educational Administration	Valid
42 Guidance	Valid

and Specialty Area tests over a five-year period. The recommended minimum qualifying scores for each test are reported in Table 3. After 1987-88, the required scores would be three standard errors of measurement below the estimated scaled score means for minimally qualified certification applicants. In 1986-87 and 1985-86, the minimum qualifying scores would be four and five, respectively, standard errors of measurement below the estimated scaled score means.

The recommendations on establishment of initial qualifying scores for the NTE Core Battery and Specialty Area tests would apply for a two-year period - 1984-86. During this two-year period, the minimum qualifying scores for the Core Battery tests and three of the Specialty Area tests would be six standard errors of measurement below the estimated scaled score mean. The minimum qualifying scores for 20 of the 23 valid Specialty Area tests were adjusted to lower levels based on a review of the score distributions for Specialty Area test examinees in the Southeast. In the judgment of the committee, lower initial qualifying scores for these 20 tests are necessary because of the anticipated adverse impact on legally protected ethnic minority group members based on previous test results.

Additional Committee Recommendations

In the course of committee deliberations, three additional recommendations were formally adopted. These recommendations to the State Department of Education were the following:

1. Inform representatives of institutions that prepare educational practitioners in Tennessee about the lack of congruence between emphases in some test areas and preparatory program curricula.
2. Suggest that college students who plan careers in education should take the Core Battery Communication Skills and General Knowledge

Table 3
Recommended Minimum Qualifying Scores on Valid NTE
Core Battery and Specialty Area Tests by Time Period

Test	Minimum Qualifying Score by Time Period			
	1984-86	1986-87	1987-88	After 1987-88
Core Battery				
Communication Skills	640	644	647	651
General Knowledge	637	640	644	647
Professional Knowledge	631	635	639	643
Specialty Area (Test Number and Name)				
1 Education in Elementary School	490	540	560	590
2 Early Childhood	490	560	580	610
3 Biology and General Science	520	560	580	600
4 English Language and Literature	480	520	540	570
5 Industrial Arts Education	550	610	630	650
6 Mathematics	520	590	610	640
7 Chemistry, Physics, and General Science	500	580	600	620
8 Social Studies	490	540	570	590
9 Physical Education	540	610	630	660
10 Business Education	530	580	600	630
11 Music Education	480	520	540	570
12 Home Economics	490	510	540	560
17 French	490	570	590	610
18 German	470	500	520	550
19 Spanish	480	530	560	580
20 Introduction to Reading	470	510	540	560
22 Speech Communication	480	560	590	620
30 Reading Specialist	480	520	550	570
31 Media Specialist	500	520	550	570
33 Speech-Language Pathology	510	540	570	590
34 Audiology	570	590	610	630
41 Educational Administration	530	550	580	610
42 Guidance	540	580	600	630

Tests as soon as their general education courses are completed (end of sophomore year or beginning of junior year of college typically).

3. Conduct a thorough review of the results of using the NTE at the end of the first, third, and fifth years during the 1984-89 time period.

Adoption of Standards

A report on the results and recommendations of this study was submitted to the Tennessee State Department of Education on June 15, 1984. The State Board of Education took action on the recommendations of the Standards Committee at the Board meeting on June 25, 1984. As recommended by the committee and the Commissioner of Education, the Board adopted for 1984-85 the minimum qualifying scores on the valid NTE tests at the levels established by the Standards Committee. The Board also expressed the intention of increasing the minimum qualifying scores on the NTE tests to the levels recommended by the committee for 1988-89, i.e., three standard errors of mesasurement below the scaled score equivalents for the estimated raw score means based on the judgments of the Knowledge Estimation Panel.

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Appendix A
Summary of Data Analyses on Content Review Ratings
of Test Items by Test

Test and Number of Items	Percentage of College Personnel Who Rated Item Content as Appropriate for Curriculum*					N
	Over 50%	Over 60%	Over 70%	Over 80%	Over 90%	
Core Battery						
Communication Skills:						
61 Listening (40)	100	100	100	100	75	17
62 Reading (30)	100	100	100	97	63	17
63 Writing-Essay	NA	NA	NA	NA	NA	NA
64 Writing-Multiple Choice (45)	100	100	100	96	82	17
General Knowledge:						
65 Literature and Fine Arts (35)	97	97	83	57	37	8
66 Mathematics (25)	96	96	96	92	76	8
67 Science (30)	97	97	83	63	17	10
68 Social Studies (30)	100	87	83	80	60	11
69 Professional Knowledge (104)	94	89	70	44	14	19
Specialty Area						
1 Education in Elementary School (147)	95	91	78	57	24	9
2 Early Childhood (149)	91	89	81	71	48	11
3 Biology and General Science (160)	98	92	79	66	37	10
4 English Language and Literature (150)	86	79	70	58	33	10
5 Industrial Arts Education (148)	89	89	76	60	35	8
6 Mathematics (120)	92	88	83	68	60	11
7 Chemistry, Physics, and General Science (150)	94	92	83	67	33	9
8 Social Studies (149)	83	83	69	45	22	8
9 Physical Education (150)	96	92	85	67	52	14
10 Business Education (158)	98	92	83	71	42	9
11 Music Education (150)	87	79	71	59	40	11
12 Home Economics (150)	98	96	89	79	60	9
13 Art Education (150)	77	67	59	48	30	10
17 French (179)	84	84	72	56	37	8
18 German (160)	80	80	64	64	34	6
19 Spanish (157)	83	76	57	41	19	9
20 Introduction to Reading (150)	92	88	82	73	64	11
22 Speech Communication (150)	83	70	50	35	12	9
30 Reading Specialist (150)	98	95	89	69	44	9
31 Media Specialist (138)	87	74	57	36	17	10
32 Education of Mentally Retarded (150)	92	89	87	77	54	9
33 Speech-Language Pathology (130)	95	95	85	59	22	8
34 Audiology (130)	99	98	95	90	72	9
41 Educational Administration (150)	97	89	77	58	29	9
42 Guidance (155)	99	97	92	77	54	9

*Table entries are percentages of items on the test.

Appendix B
Summary of Data Analyses on Comparisons of
Curriculum Content and Test Topic Emphasis by Test

Test	Difference in Relative Emphasis Index*	N
Core Battery		
Communication Skills:		
61 Listening	26.9	14
62 Reading	10.4	16
63 Writing-Essay	NA	NA
64 Writing-Multiple Choice	13.3	16
General Knowledge:		
65 Literature and Fine Arts	10.4	8
66 Mathematics	24.1	8
67 Science	25.6	10
68 Social Studies	27.7	10
69 Professional Knowledge	24.8	19
Specialty Area		
1 Education in Elementary School	16.4	11
2 Early Childhood	19.7	11
3 Biology and General Science	37.0	10
4 English Language and Literature	28.0	10
5 Industrial Arts Education	24.3	8
6 Mathematics	32.0	11
7 Chemistry, Physics, and General Science	18.7	9
8 Social Studies	41.1	8
9 Physical Education	27.6	14
10 Business Education	34.8	9
11 Music Education	38.9	10
12 Home Economics	27.9	9
13 Art Education	51.4	9
17 French	21.6	8
18 German	44.1	6
19 Spanish	22.8	9
20 Introduction to Reading	22.9	11
22 Speech Communication	37.8	9
30 Reading Specialist	33.2	9
31 Media Specialist	26.6	10
32 Education of Mentally Retarded	35.0	9
33 Speech-Language Pathology	20.8	8
34 Audiology	19.1	9
41 Educational Administration	20.6	8
42 Guidance	18.9	9

*Index range: 0 to 100
Low score indicates close similarity; high score indicates little similarity.

Appendix C
Summary of Data Analyses on Comparisons
of Curriculum and Test Content by Test

Test	Percentage of College Personnel Choosing Each Response Option*				N
	Close Parallel %	Some Difference %	Much Difference %	Little Similarity %	
Core Battery					
Communication Skills:					
61 Listening	43	43	7	7	14
62 Reading	63	37	0	0	16
63 Writing-Essay	NA	NA	NA	NA	NA
64 Writing-Multiple Choice	44	56	0	0	16
General Knowledge:					
65 Literature and Fine Arts	25	37	37	0	8
66 Mathematics	12	75	12	0	8
67 Science	20	50	30	0	10
68 Social Studies	0	80	10	10	10
69 Professional Knowledge	21	47	32	0	19
Specialty Area					
1 Education in Elementary School	18	64	18	0	11
2 Early Childhood	18	64	18	0	11
3 Biology and General Science	10	60	20	0	10
4 English Language and Literature	20	60	20	0	10
5 Industrial Arts Education	37	50	12	0	8
6 Mathematics	9	91	0	0	11
7 Chemistry, Physics, and General Science	33	67	0	0	9
8 Social Studies	12	62	25	0	8
9 Physical Education	14	64	14	0	14
10 Business Education	11	56	22	0	9
11 Music Education	10	40	50	0	10
12 Home Economics	0	78	22	0	9
13 Art Education	0	56	33	0	9
17 French	12	50	37	0	8
18 German	0	83	17	0	6
19 Spanish	0	67	33	0	9
20 Introduction to Reading	9	73	18	0	11
22 Speech Communication	0	67	33	0	9
30 Reading Specialist	33	67	0	0	9
31 Media Specialist	10	40	50	0	10
32 Education of Mentally Retarded	0	67	33	0	9
33 Speech-Language Pathology	37	37	25	0	8
34 Audiology	56	33	0	0	9
41 Educational Administration	25	62	12	0	8
42 Guidance	22	78	0	0	9

*Percentages may not equal 100% for a test due to omissions

Appendix D
Summary of Data Analyses on Job Relevance Ratings
of Test Items by Test

Test and Number of Items	Percentage of Public School Personnel Who Rated Item Content as Relevant to Job*					N
	Over 50%	Over 60%	Over 70%	Over 80%	Over 90%	
Core Battery						
Communication Skills:						
61 Listening (40)	100	90	63	35	0	17
62 Reading (30)	97	73	60	23	10	17
63 Writing-Essay	NA	NA	NA	NA	NA	NA
64 Writing-Multiple Choice (45)	100	89	78	51	16	17
General Knowledge:						
65 Literature and Fine Arts (35)	66	43	34	9	0	17
66 Mathematics (25)	76	76	76	72	60	17
67 Science (30)	70	67	63	37	17	17
68 Social Studies (30)	83	77	73	50	27	17
69 Professional Knowledge (104)	90	81	62	40	11	19
Specialty Area						
1 Education in Elementary School (147)	88	77	64	42	22	9
2 Early Childhood (149)	85	77	64	50	25	8
3 Biology and General Science (160)	85	72	72	48	29	7
4 English Language and Literature (150)	77	77	64	54	29	8
5 Industrial Arts Education (148)	77	68	56	38	20	9
6 Mathematics (120)	83	83	68	45	30	8
7 Chemistry, Physics, and General Science (150)	89	82	72	48	29	9
8 Social Studies (149)	83	64	52	33	14	9
9 Physical Education (150)	81	72	65	52	39	51
10 Business Education (158)	89	81	71	55	30	10
11 Music Education (150)	84	71	59	41	23	9
12 Home Economics (150)	92	83	83	66	42	7
13 Art Education (150)	78	67	51	34	21	10
17 French (179)	69	57	40	27	15	10
18 German (160)	78	67	55	39	22	9
19 Spanish (157)	83	69	57	42	21	9
20 Introduction to Reading (150)	76	76	65	52	32	8
22 Speech Communication (150)	81	81	63	63	33	6
30 Reading Specialist (150)	89	83	72	61	38	10
31 Media Specialist (138)	86	78	69	57	39	11
32 Education of Mentally Retarded (150)	94	88	77	61	31	10
33 Speech-Language Pathology (130)	59	50	39	34	23	12
34 Audiology (130)	92	87	72	54	23	9
41 Educational Administration (150)	89	77	63	43	17	10
42 Guidance (155)	85	77	54	34	9	9

*Table entries are percentages of items on the test.

Appendix E
Summary of Responses of Essay Panel Members
to Questions by Test Form

Question Topic		Test Form 1 (N=15)	Test Form 2 (N=15)
Specific Content Knowledge Required			
Yes	f	4	1
	%	27	7
No	f	11	14
	%	73	93
Opportunity to Learn Writing Skills Required			
Yes	f	14	14
	%	93	93
No	f	1	1
	%	7	7
Skills Relevant To Teaching			
Yes	f	15	15
	%	100	100
No	f	0	0
	%	0	0